5.5 Air Quality

5.5.1 Introduction

The Air Quality section of the EIR/EA analyzes the potential short-term, long-term, and cumulative impacts resulting from the construction and operation of the Proposed Project and alternatives. The Air Quality discussion will analyze the air quality conditions in the proposed Shingle Springs Interchange region.

Of particular concern with respect to this project is the formation of ozone, as El Dorado County, the location of the Shingle Springs Interchange, is part of a federal ozone nonattainment area. In addition, the air quality analysis addresses emissions of carbon monoxide (CO) and particulate matter. Carbon monoxide is of concern because it is associated with motor vehicle activity. Particulate matter is of concern because it is associated with construction activity.

5.5.2 Environmental Setting

Meteorology and Climate

Shingle Springs is located in the County of El Dorado, which lies within the Mountain Counties Air Basin (MCAB). The climate of the MCAB is influenced by the foothill and mountainous terrain unique to the counties included in the MCAB. El Dorado County is bordered by the Sacramento Valley to the west and the Nevada State line to the east with the western portion of the County consisting of rolling Sierra Nevada foothills, and the central and eastern portion of the County consisting of granite peaks reaching up to 10,000 feet in elevation. The climate of El Dorado County is characterized by hot dry summers and cool moist winters. The western portion of the County is characterized by higher temperatures and lower annual rainfall, and the central and eastern portions of the County are characterized by lower temperatures and higher annual rainfall.

Air quality is affected by the rate, amount, and location of pollutant emissions and the associated meteorological conditions that influence movement and dispersal of pollutants. Atmospheric conditions including wind speed, wind direction and air temperature, in combination with local surface topography (i.e., geographic features such as mountains and valleys), determine air pollutant impacts on local air quality.

The project site is best characterized as a rural environment with scattered homes, various facilities associated with the Rancheria, and Highway 50 extending in an east-west direction through the project area. Air quality in the project area is influenced mostly by pollutant

transport from upwind areas, such as the Sacramento and San Francisco Bay metropolitan areas, but also by local emissions sources, such as wood burning stoves and fireplaces during the winter months and vehicles using area roadways and Highway 50. There are no manufacturing or mining activities in the vicinity of the proposed project site.

Air Quality Monitoring

Table 5.5-1 Presents air quality monitoring data for three pollutants: CO, ozone, and PM_{10}. The data presented in **Table 5.5-1** are for the latest three years with available data for the full year. The data shown are for the Gold Nugget Way monitoring station in Placerville, and the Highway 193 station in Cool, which are the stations closest to the project site for each of the three pollutants.

Table 5.5-1 Summary of Carbon Monoxide, Ozone, and PM10 Monitoring Data

Station Location	1998	1999	2000
Carbon Monoxide (CO)			
Placerville – Golden Nugget Way			
Highest 8-hour concentration (ppm)	0.90	0.88	0.96
Days above standard (a)	0	0	0
PM 10			
Placerville – Golden Nugget Way			
Highest 24-hour concentration (ug/m3)	41	49	38
Geometric mean (ug/m3)	13	16	15
Arithmetic mean (ug/m3)	15	18	17
Percentage of days above standard (b)	0%	0%	0%
Ozone (O_3)			
Cool – Highway 193			
1st High (ppm)	0.163	0.144	0.128
2nd High (ppm)	0.144	0.135	0.126
Days above standard (c)	30	36	34
Placerville – Golden Nugget Way			
1st High (ppm)	0.139	0.129	0.119
2nd High (ppm)	0.128	0.127	0.113
Days above standard (c)	22	21	19

Source: California Air Resources Board - http://www.arb.ca.gov
(a) Days above standard = days above state 8-hour standard of 9 ppm.
(b) Days above standard = days above state daily standard of 50 ug/m^3
(c) Days above standard = days above state 1-hour standard of 0.09 ppm.

El Dorado County has been designated an "unclassified" area for the state CO air quality standards, and an "unclassified/attainment" area for the federal CO standards. As shown in **Table 5.5-1**, the CO monitoring station closest to the project site have not exceeded the CO air quality standard for the three-year period. El Dorado County is considered a nonattainment area for ozone because concentrations of this pollutant sometimes exceed the standards. As shown in **Table 5.5-1**, both the state and federal ozone standards are exceeded at the stations closest to the project site.

El Dorado County is designated an "unclassified" area for the federal PM_{10} standard, and a nonattainment area for the state PM_{10} standard. **Table 5.5-1** shows the state PM_{10} daily standard of 50 ug/m^3 has not been exceeded during the three-year period at the station closest to the project site.

Emissions Inventory

Table 5.5-2 presents emissions currently generated in El Dorado County. The information presented in **Table 5.5-2** is divided into emission source categories. The category that generates the largest amounts of ROG and NO_x emissions in El Dorado County is On-Road Motor Vehicles. The category that generates the largest amount of PM_{10} emissions is shown in **Table 5.5-2** as Miscellaneous Processes; the two largest subcategories within this one category are Residential Fuel Combustion and Unpaved Road Dust.

5.5.3 Regulatory Setting

Air quality management responsibilities exist at local, state, and federal levels of government. Air quality management planning programs developed during the past few decades have generally been in response to requirements established by the federal Clean Air Act (CAA). However, the enactment of the California Clean Air Act of 1988 (CCAA) has produced additional changes in the structure and administration of air quality management programs in California.

Air Pollutants and Ambient Standards

Both the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) have established ambient air quality standards for common pollutants. These ambient air quality standards indicate levels of contaminants that represent safe levels, to avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents.

Table 5.5-2 El Dorado County Emissions Inventory for 2000

	Carbon Monoxide		Reactive Organic Gases		Nitrogen Oxides		Inhalable Particulate Matter	
Emission Category	**Tons per Day**	**Tons per Year**	**Tons per Day**	**Tons per Year**	**Tons per Day**	**Tons per Year**	**Tons per Day**	**Tons per Year**
Fuel Combustion	7.1	1,775	0.3	75	0.4	100	0.7	175
Waste Disposal	0.1	25	0.0	0.0	0.0	0.0	0.0	0.0
Cleaning & Surface Coatings	0.0	0.0	1.1	275	0.0	0.0	0.0	0.0
Petroleum Production & Marketing	0.0	0.0	0.2	50	0.0	0.0	0.0	0.0
Industrial Processes	0.0	0.0	0.0	0.0	0.0	0.0	0.2	50
Solvent Evaporation	0.0	0.0	2.9	725	0.0	0.0	0.0	0.0
Miscellaneous Processes	39.5	9,875	2.7	675	0.7	175	19.5	4,875
On-Road Motor Vehicles	109.4	27,350	10.5	2,625	9.8	2,450	0.3	75
Other Mobile Sources	45.8	11,450	7.2	1,800	4.1	1,025	0.4	100
Natural Sources	2.4	600	0.1	25	0.1	25	0.5	125
Total	**204.3**	**51,075**	**25.0**	**6,250**	**15.1**	**3,775**	**21.6**	**5,400**

Source: Estimates of daily emissions are from CARB website: http://www.arb.ca.gov/emisinv/emsmain/emsmain.htm. The estimates of annual emissions are based on a factoring of daily values.
Note: 2000 is the latest emissions inventory available from the California Air Resources Board (CARB). The sum of values may not equal total shown due to rounding.

The federal and state ambient air quality standards and a summary of associated health effects are presented in **Table 5.5-3**. The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and PM_{10}.

Ozone

Ozone is not emitted directly into the air but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include ROG and NO_x, react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Once formed, ozone remains in the atmosphere for one or two days. It is then eliminated through chemical reaction with plants and by rainout and washout.

Table 5.5-3 Ambient Air Quality Standards Applicable in California

		Parts Per Million		Micrograms per Cubic Meter		Violation Criteria	
Pollutant	**Average Time**	**CA**	**National**	**CA**	**National**	**CA**	**National**
Ozone	1 hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years
Carbon Monoxide	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
	1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
Inhalable Particulate Matter	Annual geometric mean	N/A	N/A	30	N/A	If exceeded	N/A If exceeded If exceeded on more than 1 day per year
	Annual arithmetic mean	N/A	N/A	N/A	50	N/A	
	24 hours	N/A	N/A	50	150	N/A	

Source: CARB, 1999.
Notes: All standards are based on measurements at 25 C and 1 atmosphere pressure.
National standards shown are the primary (health effects) standards.
N/A = not applicable.

State and federal standards for ozone have been set for a one-hour averaging time. The state ozone standard is 0.09 parts per million (ppm), not to be exceeded. The federal one-hour standard is 0.12 ppm and is not to be exceeded more than three times in any three-year period at a single point of measurement. A new federal standard for ozone was issued in July 1997 by Executive Order of the President. The new ozone standard has been set at a concentration of 0.08 ppm ozone measured over 8 hours. In May 1999 a federal appeals court overturned the new ozone standard, preventing the federal government from taking actions based on the new standard. In February 2001, the U.S. Supreme Court rejected the grounds for the appellate court decision. However, the case was returned to the appellate court for additional consideration, preventing the federal government from taking actions based on the new standard. Currently, El Dorado County is classified a nonattainment area for the state standards and a severe nonattainment area for the one-hour federal ozone standard.

A new federal standard for particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) was issued in July 1997 by Executive Order of the President. $PM_{2.5}$ is sometimes referred to as "fine particulate matter". The new $PM_{2.5}$ standard has been set at a concentration of 15μμg/m^3 annually and 65μμg/m^3 daily. As with the new ozone standard, in May 1999 a federal appeals court overturned the new $PM_{2.5}$ standard, U.S. Supreme Court rejected the grounds for the appellate court decision, and the case was returned to the appellate court for additional consideration. The federal standards for PM_{10} are being maintained so that relatively larger, courser particulate matter continue to be regulated. The ARB and local air quality management districts in California have developed a $PM_{2.5}$ monitoring network. The new network is collecting data for various purposes including $PM_{2.5}$ attainment/ nonattainment designations, development and tracking of implementation plans, and assistance in health studies and other research activities.

PM_{10} and $PM_{2.5}$ can reach the lungs when inhaled, resulting in health concerns related to respiratory disease. Suspended particulate matter can also affect vision or contribute to eye irritation. PM_{10} can remain in the atmosphere for up to seven days before removal by gravitational settling, rainout and washout. Currently El Dorado County is "unclassified" for State And Federal PM_{10} Standards.

Federal Clean Air Act

The 1970 amendments to the federal CAA established a joint state and federal program to control air pollution. Pursuant to Sections 109 and 110 of the amendments, the EPA established federal air quality standards (**Table 5.5-3**). The amendments also required that states submit SIPs providing for attainment of the federal standards within certain periods of time. Because many of the original SIPs failed to bring about attainment, the CAA was amended in 1977. The federal CAA amendments of 1977 required all states to attain the federal standards by December 31, 1987. These amendments required states to submit plans that demonstrated attainment of the applicable standards by the statutory deadline.

Again, certain areas of the nation failed to meet the December 1987 deadline. In 1990, new federal CAA amendments were signed into law. Depending on the severity of an area's air pollution problem, the new amendments provided from 5 to 20 years for areas to attain the federal standards. The amendments also set new planning requirements for federal nonattainment areas.

Since El Dorado County has been designated nonattainment for national and state ozone standards, plans have been developed to achieve attainment of those standards. Under the federal CAA amendments of 1990, a federally-mandated plan (referred to as a SIP) was

developed for the ozone nonattainment area referred to as the Sacramento Valley Area Air Quality Maintenance Area, which includes all of Sacramento and Yolo counties, a portion of Solano County, all of El Dorado and Placer counties, except for the Lake Tahoe Air Basin, and the southern portion of Sutter County (El Dorado County Air Pollution Control District, 1994). This plan, the Sacramento Area Regional Ozone Attainment Plan, concluded that ozone attainment could not be met by the 1999 deadline and called for a change in classification from "serious" to "severe." EPA reclassified the Sacramento Valley Area Air Quality Maintenance Area to "severe" ozone nonattainment in 1995.

Under the federal CAA amendments of 1990, federal agencies must make a determination of conformity with the applicable SIP before taking any action on a Proposed Project. In 1993, EPA published a rule (referred herein as the "general conformity rule") that indicates how most federal agencies, including the Bureau of Indian Affairs, are to determine whether a conformity determination is required, and if so, how to make such a determination (EPA, 1993). The rule establishes "de minimis" emissions thresholds that are used to determine whether a conformity determination is required. If emissions increases due to a Proposed Project would exceed the applicable de minimis thresholds, then the rule establishes specific criteria through which a federal agency must demonstrate that the Proposed Project would conform to the SIP, despite the greater-than-de-minimis increase in emissions. In this case, the applicable de minimis thresholds, based on the current the "severe" ozone nonattainment classification of El Dorado County (and the rest of the Sacramento Valley Area Air Quality Maintenance Area), are 25 tons per year for VOC emissions and 25 tons per year for NO_x emissions. Based on the "unclassified" designation for El Dorado County, the de minimis threshold for PM_{10} is 100 tons per year.

The Clean Air Act requires that transportation projects, such as the building of new roads, that are located in nonattainment areas, and that are financed, at least in part, by federal money or approved by federal agencies must conform with mobile source emissions budgets established in the SIP. Most commonly, the demonstration of transportation conformity is made by including the project in the MTIP, which is prepared and maintained by SACOG. SACOG prepares and maintains the MTIP for its jurisdictions, which includes a portion of El Dorado County that includes the study area, and includes all or portions of five other counties in the Sacramento area. By including a project in the MTIP, SACOG shows that the project is consistent with the area's Metropolitan Transportation Plan and is in conformance with the SIP. This process is referred to as a regional transportation conformity determination. However, because of the need to proceed on an expedited schedule, the BIA has conducted a project-level transportation conformity determination of the Proposed Project. This project-level analysis replicates the analysis process used by SACOG. This project-level

transportation conformity determination compares forecasts of regional air pollutants to thresholds, sometimes referred to as "emissions budgets".

Pursuant to state air quality planning requirements, the El Dorado County California Clean Air Act Plan was developed to reduce population exposure to unhealthful levels of ozone through tighter industry controls, cleaner cars and trucks, cleaner fuels, and increased commute alternatives (El Dorado County Air Pollution Control District, 1993). This state-mandated plan is updated on a triennial basis. The Sacramento Area Regional Ozone Attainment Plan, discussed above in connection with federal air quality planning requirements, also served as one of the updates to the state-mandated ozone plan.

California Clean Air Act

The CCAA substantially added to the authority and responsibilities of the state's air pollution control districts. The CCAA establishes an air quality management process that generally parallels the federal process. The CCAA, however, focuses on attainment of the state ambient air quality standards that, for certain pollutants and averaging periods, are more stringent than the comparable federal standards.

The CCAA requires that air districts prepare an air quality attainment plan if the district violates state air quality standards for CO, sulfur dioxide (SO_2), NO_x, or ozone. No locally prepared attainment plans are required for areas that violate the state PM_{10} standards. The CCAA requires that the state air quality standards be met as expeditiously as practicable, but it does not set precise attainment deadlines. Instead, the act establishes increasingly stringent requirements for areas that will require more time to achieve the standards. The least stringent requirements apply to areas expected to achieve air quality standards by the end of 1994. The most stringent requirements apply to areas that cannot achieve the standards until after 1997.

The air quality attainment plan requirements established by the CCAA are based on the severity of air pollution problems caused by locally generated emissions. Upwind air pollution control districts are required to establish and implement emission control programs commensurate with the extent of pollutant transport to downwind districts.

Local Air Quality Management

SACOG provides regional air quality planning for the multi-county air quality maintenance area. However, the El Dorado County Air Pollution Control District (APCD) is the local agency with air pollution control authority in El Dorado County. The El Dorado County

APCD is tasked with implementing certain programs and regulations required by the federal CAA, and the CCAA.

5.5.4 Impacts And Mitigation Measures

Significance Criteria

Under the federal CAA amendments of 1990, federal agencies must make a determination of conformity with the applicable SIP before taking any action on a Proposed Project. The U.S. EPA has established "de minimis" emissions thresholds that are used to determine whether a general conformity determination is required. The applicable de minimis thresholds are 25 tons per year for VOC emissions, 25 tons per year for NO_x emissions, and 100 tons per year for PM_{10} emissions.

Carbon monoxide concentrations exceeding state or national air quality standards are considered to have a significant impact.

Methodology

Potential air emissions were assessed. The project site and alternatives were evaluated for consistency with adopted plans and policies, and ordinances, as well as compliance with federal, state and local rules and regulations.

Assumed meteorological conditions are important factors in estimating CO concentrations. The meteorological conditions assumed for this air quality report are from the *Transportation Project-Level Carbon Monoxide Protocol* (Institute of Transportation Studies, University of California, Davis 1996). The following meteorological assumptions were used:

Wind Speed (U) = 0.5 meters per second
Wind Direction = Worst Case
Atmospheric Stability Class = 7(G)
Mixing Height = 1,000 meters
Sigma Theta = 5 degrees
Surface Roughness = 100 centimeters
Temperature = 1.8^{o}C
Altitude = 0 meters

Impacts/ Mitigation

Impact 5.5-1 Construction Emissions

AA No action will occur as a result of the No Project/Action Alternative. Under the No Project/Action Alternative, neither the proposed interchange nor the proposed hotel/casino would be constructed. ***No impact*** will occur under the No Project/Action Alternative.

AB, AC Construction of the Proposed Project would result in the temporary generation of emissions of ROG, NOx, and PM_{10}. Construction-related emissions result from construction equipment exhaust, construction employee commute travel, and fugitive dust from land clearing, earthmoving, and wind erosion of exposed soil. Additionally, asphalt paving activity generates emissions of ROG. Estimate of emissions of ROG, NOx and PM_{10} generated during construction, and assumptions used in developing the estimates of construction-related emissions are presented in **Appendix E**.

Construction equipment usage rates, and total square footage for site grading and asphalt paving were based on values specific to the Proposed Project. Emissions associated with construction employee commute travel were estimated using the URBEMIS7G program.

During construction of the Proposed Project, various phases of construction would result in the use of different groups of equipment. This would result in the generation of different amounts of emissions during the various construction phases. The air quality analysis presented in this air quality report assessed construction emissions during various phases of construction. The total worst-case daily construction-related emissions associated with the interchange, without mitigation measures, would be approximately 12.92 lbs/day of ROG, 102.57 lbs/day of NO_x and 407.51 lbs/day of PM_{10} (**Appendix E**). ***Construction-related emissions of NO_x and PM_{10} would be anticipated to be a short-term mitigable significant impact.***

Mitigation 5.5-1 Construction Emissions

The following mitigation will assure that the proposed project will result is a ***less than significant impact.***

(A) Water all active construction areas at least twice daily;

(B) Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard (i.e., the minimum required space between the top of the load and the top of the trailer);

(C) Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites;

(D) Sweep daily (preferably with water sweepers) all paved access roads, parking areas and staging areas at construction sites; and

(E) Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets.

(F) Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more);

(G) Enclose, cover, water twice daily, or apply (non-toxic) soil stabilizers to exposed stockpiles (dirt, sand, etc.);

(H) Limit traffic speeds on unpaved roads to 15 miles per hour;

(I) Install sandbags or other erosion control measures to prevent silt runoff to public roadways;

(J) Replant vegetation in disturbed areas as quickly as possible;

(K) Designate a person or persons to oversee the implementation of a comprehensive dust control program and to increase watering, as necessary.

(L) To the extent feasible, require the use of construction equipment that meets the new emission standards for diesel engine-powered equipment.

(M) To reduce construction-related NOx emissions, all construction vehicles and equipment shall be properly maintained and operated.

Impact 5.5-2 Asbestos Emissions

AA No action will occur as a result of the No Project/Action Alternative. ***No impact*** will occur under the No Project/Action Alternative.

AB, AC El Dorado County is located in the Sierra Foothills. The geology of the Sierra foothills includes an abundance of serpentine rock. Serpentine rock often contains naturally-occurring asbestos. Asbestos is the name for a group of naturally-occurring silicate minerals. When serpentine rock is broken or crushed, asbestos may be released from the rock and may become airborne, causing a potential health hazard. ***The Proposed Project will result in the disturbance of asbestos-containing rock and soil, which is considered a significant but mitigableimpact.***

Mitigation 5.5-2 Asbestos Emissions

The following mitigation will assure that the proposed project will result is a ***less than significant impact.***

(A) This impact would be reduced to a less-than-significant level by complying with Chapter 8.44 of Title 8 of the El Dorado County Ordinance Code, "Naturally Occurring Asbestos and Dust Protection Ordinance". Section 8.44.030 of this ordinance specifically addresses "General Requirements for Grading, Excavation and Construction Activities".

Section 8.44.030 requires the following:

- An Asbestos Hazard Dust Mitigation Plan.
- Required construction practices, including: wetting work areas, limiting vehicle access, and covering areas with nonasbestos material.

These measures will reduce the potential for asbestos dust from becoming airborne and causing a health hazard.

Impact 5.5-3 General Conformity with the State Implementation Plan

AA No action will occur as a result of the No Project/Action Alternative. ***No impact*** will occur under the No Project/Action Alternative.

AB, AC Under the federal CAA amendments of 1990, federal agencies must make a determination of conformity with the applicable SIP before taking any action on a Proposed Project. The U.S. EPA has established "de minimis" emissions thresholds that are used to determine whether a general conformity determination is required. The applicable de minimis thresholds are 25 tons

per year for VOC emissions, 25 tons per year for NO_x emissions, and 100 tons per year for PM_{10} emissions.

As shown in **Appendix E**, implementation of the Proposed Project would result in 2.02 tons per year of VOC emissions, 16.00 tons per year of NO_x emissions, and 55.98 tons per year of PM_{10} emissions. Since these values are lower than the de minimis thresholds, a general conformity determination is not necessary for the Proposed Project. ***Therefore, the Flyover Interchange Design Alternative and Diamond Interchange Design Alternative are not expected to result in a significant impact to the environment.***

Mitigation 5.5-3 General Conformity with the State Implementation Plan

None Required.

Impact 5.5-4 Transportation Conformity with the State Implementation Plan

AA No action will occur as a result of the No Project/Action Alternative. ***No impact*** will occur under the No Project/Action Alternative.

AB, AC The general approach used in conducting the transportation air quality conformity analysis was to develop forecasts of regional mobile source emission levels, including emissions associated with the Shingle Springs Rancheria project, and compare these emission levels to previously-established thresholds. The thresholds, referred to as "emissions budgets", were established during development of the Sacramento area's SIP. The project's conformity with the SIP is demonstrated when the forecasted emission levels, including the project, are found to be within the emissions budgets.

The approach used in the project-level air quality conformity analysis of the Shingle Springs Rancheria project is the same as the approach used by the SACOG in the regional air quality conformity analysis of Amendment 99-2 to the 1999 MTP and Amendment 01-04 (including Supplement A) to the fiscal year 2000/2001 MTIP.

For the conformity analysis of the Shingle Springs Rancheria project, emission levels were compared to emissions budgets for three types of

pollutants: ROG, NOx, and CO. The comparison was made for three analysis years: 2005, 2015, and 2025.

The technical analysis involved the use of three types of computer simulation models: SACMET, a travel simulation model; EMFAC7F version 1.1, a motor vehicle emission rate model; and DTIM2, a mobile source emissions model. All of these are the latest models approved for use in conducting conformity analyses in the Sacramento area. All of these models use the latest available planning assumptions.

Table 5.5-4 present a summary of the project-level transportation air quality conformity analysis results. For each of the three analysis years, and each of the three types of pollutants, **Table 5.5-4** presents estimates of regional mobile source emissions. The estimates include emissions associated with the Shingle Springs Rancheria project as well as emissions for all other projects included in the latest MTIP and MTP.

Table 5.5-4 also presents the emissions budget for each of the three types of pollutants analyzed for this conformity analysis. For ROG, the emission budget is 31.32 tons per day (tpd). For NOx, the emission budget is 61.35 tpd. For CO, the emission budget is 780 tpd.

As shown in **Table 5.5-4**, the estimates of regional mobile source emissions for each of the three analysis years and each of the three types of pollutants are less than the emissions budget. Since these emission estimates, which include emissions associated with the Shingle Springs Rancheria project, are less than the emissions budgets, the Shingle Springs Rancheria project conforms with the SIP. ***Therefore, the proposed project is not expected to result in a significant impact to the environment.***

Mitigation 5.5-4 Transportation Conformity with the State Implementation Plan

None Required.

Table 5.5-4. Comparison of Forecasted Emissions and Emissions Budgets

Emissions Category	Analysis Year 2005	2015	2025
Reactive Organic Gases			
Forecasted Emissions	29.00	17.53	18.49
Emissions Budget	31.32	31.32	31.32
Pass Conformity Test?	Yes	Yes	Yes
Nitrogen Oxide Emissions			
Forecasted Emissions	56.82	43.54	48.77
Emissions Budget	61.35	61.35	61.35
Pass Conformity Test?	Yes	Yes	Yes
Carbon Monoxide Emissions			
Forecasted Emissions	248.77	217.91	244.22
Emissions Budget	780	780	780
Pass Conformity Test?	Yes	Yes	Yes

Source: CCS, 2002.

Impact 5.5-5 Carbon Monoxide Emissions

AA No action will occur as a result of the No Project/Action Alternative. ***No impact*** will occur under the No Project/Action Alternative.

AB, AC Ambient CO concentrations associated with AB and AC are the sum of background CO levels and the project contribution from vehicular emissions. Background CO is attributable to a variety of emission sources that exist locally, outside of the highway network being specifically modeled in the microscale analysis.

The estimation of project-related CO concentrations is based on three major categories of data:

- an estimate of the number of vehicles (peak hour traffic volumes),
- emission factors (the rate of CO emitted by vehicles), and
- dispersion patterns (how the CO from vehicles disperses).

The analysis of CO concentrations conducted for this air quality analysis was conducted according methods described in the following documents:

- *Transportation Project-Level Carbon Monoxide Protocol* (Institute of Transportation Studies, University of California, Davis 1996); and

- Air Quality Technical Analysis Notes (California Department of Transportation 1988).

The air quality microscale dispersion model used for this air quality analysis, CAL1NE4, is a line source model developed by Caltrans (California Department of Transportation 1989). It is based on the Gaussian diffusion equation and employs a mixing zone concept to characterize pollutant dispersion over the roadway. Given source strength, meteorology, and site geometry, CALINE4 can predict pollutant concentrations for receptors located within 500 meters (1,500 feet) of the roadway.

The CALINE4 model was used to estimate one-hour average CO concentrations at receptor locations. A persistence factor of 0.7 was applied to the one-hour average values to estimate eight-hour average values (Institute of Transportation Studies, University of California, Davis 1996).

Location Analyzed

The CO analysis conducted for this air quality analysis focused on the proposed new interchange. This location was selected for analysis because the interchange area would be exposed to CO contributions from both the relatively high traffic volumes along U.S. 50 and the new project-related travel along the interchange ramps.

Background Carbon Monoxide Levels

Background CO concentrations used in the analysis were based on the closest locally-measured monitoring values. As recommended in *Air Quality Technical Analysis Notes* (California Department of Transportation 1988), the second highest annual maximum one-hour average concentration during a

three year period was used as the background value. The second highest annual maximum one-hour average value of 2.0 ppm, measured at the Gold Nugget Way station in Placerville, was used in this air quality report.

Traffic Data

The CALINE4 modeling analysis used peak hour traffic data from the traffic analysis conducted for the Proposed Project. The traffic data included peak hour volumes, intersection geometrics, and intersection operational characteristics. Traffic data for Existing Plus Project Condition and 2025 Cumulative Plus Project Conditions were used.

Emission Factors

On-road motor vehicle emission rates, usually expressed in grams per vehicle mile, were used in the analysis of CO concentrations. The estimate of motor vehicle emission rates takes into account the combined effects of vehicle operating mode, types of vehicles, temperature, vehicle speed, year, and altitude. Motor vehicle emission rates used for this report were generated from the CARB emission factor model EMFAC7F (Version 1.1). Emission rates used in the analysis were based on the following data:

- The project location is under 1,219 meters (4,000 feet) elevation,
- The adjusted January mean minimum temperature is 40^{o}F,
- The project location has a motor vehicle inspection and maintenance program,
- The traffic mix listed in **Appendix F**.

The output files for EMFAC7F (Version 1.1) are included in **Appendix E**.

The motor vehicle fleet mix used are from the *Transportation Project-Level Carbon Monoxide Protocol* document. Recent changes in the vehicle purchasing behavior has resulted in an increase in the relative portion of the vehicle fleet made up of sport utility vehicles (SUVs). At the time this air quality study was prepared, air quality planning agencies in the Sacramento area were considering changes to the planning assumptions for motor vehicle fleet mix to reflect the relative increase in SUVs. However, the agencies have not reached agreement on the revised values and these values are, therefore,

not available for use in air quality analysis. Use of the revised values with a relatively larger portion of SUVs would likely result in slightly higher CO concentrations. However, the qualitative conclusions of the CO analysis would not change.

Emission rates for 2000 were used in the analysis of Existing Conditions. Year 2025 Cumulative Plus Project traffic conditions were also analyzed. However, EMFAC7F (Version 1.1) does not estimate emission rates for years after 2020. Therefore, emission rates for 2020 were used in the analysis of 2025 conditions. Since the fleet average emission rate decreases over time, use of 2020 emission rates conservatively over-estimates 2025 concentrations.

Receptor Locations

The CALINE4 model estimates CO concentrations at specific locations. These locations are referred to as "receptors" and represent specific locations in the study area. Because of the low density of development in the vicinity of the project site, there is a lack of identifiable actual receptors. Four hypothetical receptors were located at the edge of the U.S. 50 right-of-way,

- Northeast of the proposed new interchange,
- West of the interchange,
- South of the interchange, and
- East of the interchange.

In addition, 16 receptors were located on existing structures nearest to the proposed location of the interchange.

Findings

A summary of the results of the CALINE4 CO analysis is presented in **Table 5.5-5**. Estimated CO concentrations at each of the receptor locations are presented.

The summary shows the analysis results for Existing Plus Project Conditions, and 2025 Cumulative Plus Project Conditions. For each condition, both 1-hour average and 8-hour average CO concentrations are presented.

Table 5.5-5 Carbon Monoxide Concentrations at the Shingle Springs Rancheria Interchange on U.S. 50

Receptor	Flyover Interchange				Diamond Interchange			
	Existing Conditions		2025 Plus Project Conditions		Existing Conditions		2025 Plus Project Conditions	
	One Hour Average	Eight Hour Average	One Hour Average	Eight Hour Average	One Hour Average	Eight Hour Average	One Hour Average	Eight Hour Average
Northeast of the Interchange	2.9	2.0	2.4	1.7	3.0	2.1	2.5	1.8
West of the Interchange	2.7	1.9	2.4	1.7	2.8	2.0	2.4	1.7
South of the Interchange	2.8	2.0	2.4	1.7	2.9	2.0	2.4	1.7
East of the Interchange	2.7	1.9	2.4	1.7	2.8	2.0	2.4	1.7
450 Meters Southeast of Artesia/ Access	2.4	1.7	2.2	1.5	2.5	1.8	2.3	1.6
East of “tee” and 135 Meters East of U.S. Centerline	2.5	1.8	2.2	1.5	2.6	1.8	2.3	1.6
South of US 50 and West of Hope Lane	2.6	1.8	2.3	1.6	2.7	1.9	2.3	1.6
Southeast of Existing Casino	3.0	2.1	2.5	1.8	2.9	2.0	2.5	1.8
Southwest of Existing Casino	2.8	2.0	2.4	1.7	2.9	2.0	2.5	1.8
Northwest of the Interchange and 90 Meters North of US 50 Centerline	2.6	1.8	2.3	1.6	2.7	1.9	2.3	1.6
North of US 50 and East of Pinnacle Ct.	2.4	1.7	2.2	1.5	2.4	1.7	2.2	1.5
Northwest of the Interchange and 120 Meters North of US 50 Centerline	2.5	1.8	2.2	1.5	2.6	1.8	2.3	1.6
South of “tee” and 100 Meters South of U.S. Centerline	2.5	1.8	2.3	1.6	2.7	1.9	2.3	1.6
West of the Interchange and 100 Meters North of US 50 Centerline	2.6	1.8	2.3	1.6	2.7	1.9	2.4	1.7
East of the Interchange and 100 Meters South of US 50 Centerline	2.5	1.8	2.3	1.6	2.6	1.8	2.3	1.6
Northeast of the Interchange and 100 Meters North of US 50 Centerline	2.6	1.8	2.3	1.6	2.7	1.9	2.4	1.7
South of the Interchange and 125 Meters South of US 50 Centerline	2.5	1.8	2.2	1.5	2.6	1.8	2.3	1.6
South of the Interchange and 180 Meters South of US 50 Centerline	2.4	1.7	2.2	1.5	2.5	1.8	2.2	1.5
Northwest on the Interchange and 150 Meters North of US 50 Centerline	2.5	1.8	2.3	1.6	2.6	1.8	2.3	1.6
Northeast of the Interchange and 150 Meters South of US 50 Centerline	2.6	1.8	2.3	1.6	2.7	1.9	2.3	1.6

Source: CALINE4 microscale air quality dispersion model.
Note: All values are in parts per million of Carbon Monoxide. State one-hour standard for Carbon Monoxide is 20 parts per million. State eight-hour standard for Carbon Monoxide is 9 parts per million.

Since CO concentrations under both Existing Plus Project Conditions and 2025 Cumulative Plus Project Conditions are lower than the CO air quality standards, the impact is considered ***less than significant***. The CAL1NE4 output files are included in **Appendix E.**

Mitigation 5.5-5 Carbon Monoxide Emissions

None Required.

Impact 5.5-6 Cumulative Carbon Monoxide Impacts

AA The No Project/Action Alternative will not contribute to cumulative air quality impacts. ***No impact*** will result from the No Project/Action Alternative.

AB, AC As shown in Table 5.5-5, under Existing Plus Project Conditions, the highest 1-hour average CO concentration is 3.0 ppm and the highest 8-hour average CO concentration is 2.1 ppm. These concentrations are estimated to occur southeast of the existing casino site. The state 1-hour average CO standard is 20 ppm. The state and federal 8-hour average CO standard is 9 ppm. Both the 1-hour value and the 8-hour value under Existing Plus Project Conditions are below the CO air quality standard.

Under 2025 Cumulative Plus Project Conditions, the highest 1-hour average CO concentration is 2.5 ppm and the highest 8-hour average CO concentration is 1.8 ppm. These concentrations are estimated to occur southeast of the existing casino site. The state 1-hour average CO standard is 20 ppm. The state and federal 8-hour average CO standard is 9 ppm. Both the 1-hour value and the 8-hour value under 2025 Cumulative Plus Project Conditions are below the CO air quality standard. ***Therefore, the Flyover Interchange Design Alternative and Diamond Interchange Design Alternative are not expected to result in a significant impact to the environment.***

Mitigation 5.5-6 Cumulative Carbon Monoxide Impacts

None Required.